

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1. (Currently Amended) A method of determining layer thickness of a particular area of a substrate during CMP of the substrate, the method comprising:

- acquiring an image of a particular area of the substrate while the substrate is moving at a speed of at least 200 lineal feet per minute using high speed imaging;
- comparing the acquired ~~high speed~~ image to each one of a plurality of stored image patterns; and
- converting the acquired ~~high speed~~ image into a layer thickness measurement when the acquired ~~high speed~~ image corresponds to one of said plurality of stored image patterns.

Claim 2. (Previously Presented) The method of claim 1, wherein acquiring an image of a particular area of the substrate includes:

- projecting a conventional light source onto the substrate; and
- utilizing a high speed camera.

Claim 3. (Previously Presented) The method of claim 1, wherein acquiring an image of a particular area of the substrate includes:

- delivering a pulse of light from a coherent light source onto the particular area of the substrate; and

utilizing a conventional camera.

Claim 4. (Original) The method of claim 3, wherein said coherent light source comprises a laser.

Claim 5. (Previously Presented) The method of claim 1, wherein acquiring an image of a particular area of the substrate includes:

delivering a pulse of light from a broad band light source onto the particular area of the substrate; and

utilizing a conventional camera.

Claim 6. (Original) The method of claim 5, wherein said broad band light source comprises a flash lamp.

Claim 7. (Currently Amended) The method of claim 1, wherein converting the acquired ~~high-speed~~ image into a layer thickness measurement includes converting pixels of the acquired ~~high-speed~~ image into layer thickness.

Claim 8. (Original) The method of claim 1, wherein said determination of layer thickness of the substrate is performed in situ.

Claim 9. (Currently Amended) An apparatus for determining layer thickness of a particular area of a substrate during CMP of the substrate comprising:

~~a high-speed~~ an imager adapted to acquire an image of a particular area of the substrate while the substrate is rotating in situ at a speed of at least 200 lineal feet per minute;

a processing unit in electronic communication with said ~~high-speed~~ imager;
a memory device in electronic communication with said processing unit and containing a plurality of instructions which, when executed by said processing unit, causes said processing unit to:

compare the image acquired by said ~~high-speed~~ imager to each one of a plurality of image patterns stored in said memory device; and

convert the acquired image into a layer thickness measurement when said acquired image corresponds to one of said plurality of image patterns stored in said memory device.

Claim 10. (Currently Amended) The apparatus of claim 9, wherein said ~~high-speed~~ imager comprises:

a pulsed, coherent light source; and
a conventional camera.

Claim 11. (Original) The apparatus of claim 10, wherein said coherent light source comprises a laser.

Claim 12. (Currently Amended) The apparatus of claim 9, wherein said ~~high-speed~~ imager comprises:

a conventional light source; and

a high speed camera.

Claim 13. (Currently Amended) The apparatus of claim 9, wherein said ~~high speed~~ imager comprises:

a pulsed, broad band light source; and

a conventional camera.

Claim 14. (original) The apparatus of claim 13, wherein said broad band light source comprises a flash lamp.

Claim 15. (Currently Amended) A method of determining end-point during CMP of a substrate comprising:

rotating the substrate;

acquiring an image of an area of the rotating substrate while the substrate is moving at a speed of at least 200 lineal feet per minute using an a high speed imager;

comparing the acquired image to stored image patterns; ~~and~~

converting the acquired image into a layer thickness measurement when the acquired image corresponds to one of the compared stored image patterns; and

stopping CMP based upon the layer thickness measurement.

Claim 16. (Previously Presented) The method of claim 15, wherein acquiring an image of an area of the rotating substrate includes:

projecting a conventional light source onto the area of the substrate; and

utilizing a high speed camera.

Claim 17. (Previously Presented) The method of claim 15, wherein acquiring an image of an area of the rotating substrate includes:

delivering a pulse of light from a coherent light source onto the area of the substrate; and

utilizing a conventional camera.

Claim 18. (Original) The method of claim 17, wherein said coherent light source comprises a laser.

Claim 19. (Previously Presented) The method of claim 15, wherein acquiring an image of an area of the rotating substrate includes:

delivering a pulse of light from a broad band light source onto the area of the substrate; and

utilizing a conventional camera.

Claim 20. (original) The method of claim 19, wherein said broad band light source comprises a flash lamp.

Claim 21. (Previously Presented) The method of claim 15, wherein converting the acquired image into a layer thickness measurement when the acquired image corresponds to one of the compared stored image patterns includes converting pixels of the acquired image into a layer thickness measurement.

Claim 22. (Previously Presented) The method of claim 15, wherein said acquiring an image of an area of the rotating substrate is performed in situ.

Claim 23. (Currently Amended) An apparatus for determining end-point of an area of a substrate during CMP of the substrate comprising:

~~an a high-speed~~ imager configured to acquire images of the substrate while the substrate is rotating in situ at a speed of at least 200 lineal feet per minute;

a processing unit in electronic communication with said ~~high-speed~~ imager;

a memory device in electronic communication with said processing unit and containing a plurality of instructions which, when executed by said processing unit, causes said processing unit to:

compare images of the substrate acquired by said ~~high-speed~~ imager to image patterns stored in said memory device;

convert an acquired image into a layer thickness measurement when said acquired image corresponds to a selected image pattern stored in said memory device; and

stop CMP based upon the layer thickness measurement.

Claim 24. (Currently Amended) The apparatus of claim 23, wherein said ~~high-speed~~ imager comprises:

a pulsed, coherent light source; and

a conventional camera.

Claim 25. (Original) The apparatus of claim 24, wherein said coherent light source comprises a laser.

Claim 26. (Currently Amended) The apparatus of claim 23, wherein said ~~high-speed~~ imager comprises:

- a conventional light source; and
- a high speed camera.

Claim 27. (Currently Amended) The apparatus of claim 23, wherein said ~~high-speed~~ imager comprises:

- a pulsed, broad band light source; and
- a conventional camera.

Claim 28. (original) The apparatus of claim 27, wherein said broad band light source comprises a flash lamp.